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EXAMINER	
KIM, DAVID S	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 07/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/072,707	HOULE ET AL.	
	Examiner	Art Unit	
	David S. Kim	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7,9-14,16,18-25 and 27-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,9-14,16,18-25 and 27-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Applicant's compliance with the objections to the drawings in the previous Office Action (mailed on 28 April 2006) is noted and appreciated. Applicant presents arguments to assert that Fig. 4A is supported in the Applicant's specification, citing portions from p. 8-9 of the specification (arguments filed on 28 April 2006, p. 10+). In particular, citation of the following portion is persuasive:

> "Alternatively, error correction coding techniques may also be employed on both the higher data rate and lower data rate signals with different coding gain" (Applicant's specification, p. 9, l. 20-22).

In the context of the specification, "the higher data rate signal" corresponds to an OC-192 signal, and "the lower data rate signal" corresponds to an OC-48 signal. Accordingly, the drawing replacement sheet of Fig. 4A, filed on 24 March 2005, is approved.

Claim Objections

2. Applicant's compliance with the objections to claims 9 and 33 in the previous Office Action (mailed on 28 April 2006) is noted and appreciated. Applicant overcomes these objections by amending these claims. Accordingly, these objections are withdrawn.

3. **Claims 10-12** are objected to because of the following informalities:

Due to the new amendments to parent claim 9, "coding scheme" now lacks antecedent basis in claims 10-12.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. Applicant's response to the rejection of **claims 2-4, 10-12, 18-19, and 28-30** under 35 U.S.C. 112, first paragraph (written description), in a previous Office Action (mailed on 28 December 2005) is noted and appreciated. Applicant responded by presenting arguments (filed on 28 April 2006, p. 11+). These arguments are not persuasive, and Examiner responds to these arguments in the "Response to Arguments" section below. Accordingly, the previous rejection of claims 2-4, 10-12, 18-19, and 28-30 under 35 U.S.C. 112, first paragraph (written description) is presented again below.

Applicant's response to the rejection of **claims 5, 13, 23, and 25** under 35 U.S.C. 112, first paragraph (written description), in a previous Office Action (mailed on 28 December 2005) is noted and appreciated. Applicant responded by presenting arguments (filed on 28 April 2006, p. 11+). These arguments are persuasive, and the previous rejection of claims 5, 13, 23, and 25 under 35 U.S.C. 112, first paragraph (written description), is withdrawn.

Applicant's response to the rejection of **claims 9-14** under 35 U.S.C. 112, first paragraph (written description), in a previous Office Action (mailed on 28 December 2005) is noted and appreciated. Applicant responded by amending these claims. These amendments overcome the previous rejection, and the previous rejection of claims 9-14 under 35 U.S.C. 112, first paragraph (written description), is withdrawn.

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. **Claims 2-4, 10-12, 18-19, and 28-30** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Similar to the comments presented in a previous Office Action (Advisory Action mailed on 07 December 2005), Examiner finds that Applicant's amendments to claims 2, 10, 18-19, and 28-30 introduce **new matter**. In particular, notice that they introduce a ***particular*** coding scheme to a particular "first" signal in the embodiment of Applicant's invention that employs error correction coding on multiple data signals. Although Applicant's disclosure does introduce the use of a particular coding scheme (Reed-Solomon, G.975, G.709 in p. 9+) on a particular "first" signal (middle signal in Fig. 2), this usage of a ***particular*** coding scheme is ***only disclosed*** for an embodiment of Applicant's invention that employs error correction coding on ***only one*** data signal (embodiment in Fig. 2), ***not multiple*** data signals (embodiment in Figs. 4A-4B). Applicant's disclosure does not disclose the use of a ***particular*** coding scheme (such as Reed-Solomon coding, standard G.975 coding, or standard G.709

coding) in the embodiment of the invention that employs error correction coding on multiple data signals. Accordingly, as Applicant's amendments to claims 2, 10, 18-19, and 28-30 introduce these limitations that are not taught by Applicant's disclosure, these same amendments introduce new matter to claims 2-4, 10-12, 18-19, and 28-30.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. **Claims 1, 2, 5-7, 9-10, 13-14, 16, 18, 20-25, 27-28, and 31-33** are rejected under 35 U.S.C. 103(a) as being unpatentable over Swanson et al. (U.S. Patent No. 6,433,904 B1, hereinafter "Swanson").

(**claim 1**) Swanson discloses:

A method for transmitting a WDM signal:

modulating a first optical signal on a first wavelength with a first data signal having a first data rate to generate a first modulated optical signal having a first bandwidth (channel 1 in Fig. 3);

modulating a second optical signal on a second wavelength with a second data having a second data rate to generate a second modulated optical signal having a signal having a second bandwidth (channel 2 in Fig. 3), said second bandwidth being greater than said first bandwidth (example of channels

with differing bandwidths in col. 6, l. 11-26) and said WDM signal comprising said first modulated optical signal and said second modulated optical signal.

Swanson does not expressly disclose:

applying error correction coding to said first and second data signals such that said second data signal experiences a greater coding gain than said first data signal.

Rather, Swanson discloses applying error correction coding (FEC encoder 40) to ***one*** of the data signals so that the error correction coded data signal experiences a greater coding gain than the other uncoded data signal. However, coding ***multiple*** data signals such that one coded data signal experiences a greater coding gain than another coded data signal is obvious within the teachings of Swanson. For example, consider the section "4. Channel Upgrades" on col. 6, l. 6+. It discusses the general procedure for upgrading channels. Swanson provides examples of upgrading from one data rate to another data rate (Fig. 3, col. 8, l. 2-9). However, Swanson does not limit these upgrading teachings to the specific data rates discussed in the examples. That is, Swanson employs a more general formula that applies to a variety of data rates and upgrade situations:

> "[I]f the system was originally designed for a channel at rate R, and it is desired to utilize that channel at rate R', then a code with coding gain of nominally $10*\log_{10}(R'/R)$ should be chosen" (col. 7, l. 66 – col. 8, l. 2).

Additionally, Swanson describes a variety of codes from which one could choose for implementing a channel upgrade: Reed-Solomon codes, BCH codes, block codes, convolutional codes, concatenated codes, SOVA with convolutional codes, etc. (col. 7, l. 1-57). These codes provide differing amounts of coding gain. Combined with Swanson's formula quoted above, Swanson's upgrading teachings include a variety of data rate upgrades. For example, a data rate upgrade by a factor of 4 corresponds to $10*\log_{10}(4/1) \sim 6$ dB coding gain, which could correspond to a Reed-Solomon code (col. 7, l. 10-12). A data rate upgrade by a factor of 16 corresponds to $10*\log_{10}(16/1) \sim 12$ dB coding gain, which could correspond to a concatenated code of a convolutional code and a block code, with SOVA on the convolutional code (col. 7, l. 34-50). Thus, Swanson's upgrading teachings suggest examples of channel upgrading other than the explicit examples of Swanson (Fig. 3, col. 8, l. 2-9).

Accordingly, it is clear that the limitation of "applying error correction coding to multiple data signals such that said one data signal experiences a greater coding gain than another data signal" is within the bounds of technical capability of Swanson. That is, one could reasonably expect to be able to implement this limitation according to the upgrading teachings of Swanson. However, the question remains, "Would it be obvious to do so?"

At the time the invention was made, yes, it would have been obvious to one of ordinary skill in the art to implement this limitation. One of ordinary skill in the art would have been motivated to do this to implement further upgrading of channels (col. 6, l. 8). That is, consider a system that already has an upgraded channel according to Swanson's upgrading teachings, e.g., a system, similar to Fig. 3, with a channel that has been upgraded by a factor of 4, similar to col. 8, l. 2-9. If one desires to further upgrade another channel to increase channel capacity, e.g., by a factor of 16, one would simply apply Swanson's upgrading teachings to a channel that has not been upgraded. The motivation would be the common improvement of increased transmission capacity (col. 6, l. 8), which is an explicit purpose of Swanson's teachings (col. 3, l. 3-7).

(**claim 2**) Swanson discloses:

The method of claim 1 wherein error correction coding applied to said first signal comprises Reed-Solomon coding (e.g., col. 8, l. 2-9).

(**claim 5**) Swanson does not expressly disclose:

The method of claim 1 wherein said first data signal comprises an OC-48 signal and said second data signal comprises an OC-192 signal.

However, such a usage of an OC-48 signal and an OC-192 signal is well within the scope of Swanson's teachings. Simply start with common OC-12 channels and apply Swanson's teachings as described in the obviousness argument presented regarding claim 1 above.

(**claim 6**) Swanson discloses:

The method of claim 1 further comprising:

multiplexing said first modulated optical signal and said second modulated optical signal together to form said WDM signal (combiner 16 in Fig. 3).

(**claim 7**) Swanson discloses:

The method of claim 1 wherein said first modulated optical signal and said second modulated optical signal have substantially similar power levels when multiplexed together (Fig. 2C).

(**claim 9**) A method of receiving a WDM signal, said method comprising:

demodulating a first modulated optical signal derived from said WDM signal to form a first recovered data signal, said first modulated optical signal having a first bandwidth (channel 1 in Fig. 3);

demodulating a second modulated optical signal derived from said WDM signal to form a second recovered data signal (channel 2 in Fig. 3), said second modulated optical signal having a second bandwidth greater than said first bandwidth (example of channels with differing bandwidths in col. 6, l. 11-26); and

decoding (FEC decoder 42) said first and second recovered data signals in accordance with error correction coding applied to first and second data signals (see the obviousness argument presented in the treatment of claim 1 above) wherein a lower signal to noise ratio of said second modulated optical signal is compensated for relative to said first modulated optical signal (col. 5, l. 19-32; col. 6, l. 11-26).

(**claim 10**) The method of claim 9 wherein said error correction coding comprises a Reed-Solomon encoding scheme of said first recovered data signal (col. 8, l. 2-9).

(**claim 13**) Swanson does not expressly disclose:

The method of claim 9 wherein said first recovered data signal comprises an OC-48 signal and said second recovered data signal comprises an oC-192 signal.

However, such a usage of an OC-48 signal and an OC-192 signal is well within the scope of Swanson's teachings. Simply start with common OC-12 channels and apply Swanson's teachings as described in the obviousness argument presented regarding claim 1 above.

(**claim 14**) The method of claim 9 wherein said first modulated optical signal and said second modulated optical signal are received with substantially similar power levels (Fig. 2C).

(**claims 16, 18, and 20**) Claims 16, 18, and 20 introduce limitations that correspond to limitations introduced by claims 1, 2, and 1, respectively. Therefore, the recited limitations in claims 1-2 read on the corresponding limitations in claims 16, 18, and 20.

(claim 21) Swanson discloses:

The WDM transmission system of claim 16 further comprising:

a first amplifier (e.g., amplifier 1 in Fig. 3) that amplifies said first modulated optical signal; and

a second amplifier (e.g., amplifier 2 in Fig. 3) that amplifies said second modulated optical signal, wherein amplified power levels of said first modulated optical signal and said second modulated optical signals are substantially similar (Fig. 2C).

(claims 22-23) Claims 22 and 23 introduce limitations that correspond to limitations introduced by claims 6 and 5, respectively. Therefore, the recited limitations in claims 5-6 read on the corresponding limitations in claims 22-23.

(claim 24) Swanson discloses:

A WDM receiver system comprising:

a first optical receiver (e.g., o/e converters in Fig. 3) that recovers a first recovered data signal from a first modulated optical signal on a first wavelength (e.g., channel upgraded by a factor of 4);

a second optical receiver (e.g., o/e converters in Fig. 3) that recovers a second recovered data signal from a second modulated optical signal on a second wavelength (e.g., channel upgraded by a factor of 16);

a first error correction decoding block (e.g., decoder 42 in Fig. 3) that decodes said first recovered data signal in accordance with an error correction code (e.g., Reed-Solomon code) imposed on data of said first recovered data signal; and

a second error correction decoding block (e.g., another instance of decoder 42 in Fig. 3, not shown but obvious by the obviousness argument regarding claim 1 above) that decodes said second recovered data signal in accordance with an error correcting code (a concatenated code of a convolutional code and a block code, with SOVA on the convolutional code) imposed on data of said second recovered data signal, said error correcting code of said second error correction decoding block (see the obviousness argument regarding claim 1 above) compensating for a lower signal to noise ratio of said second modulated optical signal compared to said first modulated optical signal (col. 5, l. 19-32; col. 6, l. 11-26; consider these portions of Swanson in view of the obviousness argument regarding claim 1 above).

(**claim 25**) Swanson does not expressly disclose:

The WDM receiver system of claim 24 wherein said first recovered data signal comprises an OC-48 signal and said second recovered data signal comprises an OC-192 signal.

However, such a usage of an OC-48 signal and an OC-192 signal is well within the scope of Swanson's teachings. Simply start with common OC-12 channels and apply Swanson's teachings as described in the obviousness argument presented regarding claim 1 above.

(**claim 27**) Swanson discloses:

The WDM receiver system of claim 24 wherein said second modulated optical signal has a greater bandwidth (e.g., channel upgraded by a factor of 16) than said first modulated optical signal (e.g., channel upgraded by a factor of 4).

(**claim 28**) Claim 28 introduces limitations that correspond to limitations introduced by claim 10. Therefore, the recited limitations in claim 10 read on the corresponding limitations in claim 28.

(**claim 31**) Swanson discloses:

The WDM receiver system of claim 24 wherein said first modulated optical signal and said second modulated optical signals are received with substantially similar power levels (Fig. 2C).

(**claims 32-33**) Claims 32 and 33 introduce limitations that correspond to limitations introduced by claims 1 and 27, respectively. Therefore, the recited limitations in claims 1 and 27 read on the corresponding limitations in claims 32-33.

10. **Claims 3-4, 11-12, 19, and 29-30** are rejected under 35 U.S.C. 103(a) as being unpatentable over Swanson in view of the admitted prior art (hereinafter the "APA").

Regarding these claims, Swanson does not expressly disclose these limitations, but the APA shows that these limitations are well known and conventional to apply.

(**claim 3**) The method of claim 2 wherein said Reed-Solomon coding comprises coding in accordance with the G.975 standard (Applicant's specification, p. 9-10 bridging paragraph).

(**claim 4**) The method of claim 2 wherein said Reed-Solomon coding comprises coding in accordance with the G.709 standard (Applicant's specification, p. 9-10 bridging paragraph).

(claims 11-12) Claims 11 and 12 introduce limitations that correspond to limitations introduced by claims 3 and 4, respectively. Therefore, the recited steps in method claims 3-4 read on the corresponding steps in method claims 11-12.

(claims 19) Claim 19 introduces limitations that correspond to limitations introduced by claim 3. Therefore, the recited steps in method claim 3 read on the corresponding means in system claim 19.

(claims 29-30) Claims 29 and 30 introduce limitations that correspond to limitations introduced by claims 3 and 4, respectively. Therefore, the recited steps in method claims 3-4 read on the corresponding means in system claims 29-30.

Response to Arguments

35 U.S.C. 112, first paragraph (written description)

11. Applicant's arguments, filed on 28 April 2006, with respect to the previous rejection of claims 2-4, 10-12, 18-19, and 28-30 under 35 U.S.C. 112, first paragraph (written description), have been fully considered but they are not persuasive. The previous rejection of claims 2-4, 10-12, 18-19, and 28-30 under 35 U.S.C. 112, first paragraph, was presented since the claim language disclosed new matter: introducing a ***particular*** coding scheme to a particular "first" signal in the embodiment of Applicant's invention that employs error correction coding on ***multiple*** data signals. Although Applicant's response is noted and appreciated, these arguments are not persuasive.

Although Applicant discloses particular coding schemes (Applicant's specification, p. 9) and the embodiment (Applicant's specification, p. 8, l. 20-22) of Applicant's invention that employs error correction coding on multiple data signals, Applicant does not disclose the ***actual, positive application*** of a ***particular*** coding scheme ***to this*** embodiment. That is, the invention disclosed in claims 2-4, 10-12, 18-19, and 28-30 includes the actual, positive application of (1) Reed-Solomon coding, G.709 coding, and G.975 coding to (2) the embodiment of Applicant's invention that employs error correction coding on multiple data signals. However, the specification lacks this detailed level of disclosure. Rather, the specification only positively discloses (1) Reed-Solomon coding, G.709 coding, and G.975 coding and (2) the embodiment of Applicant's invention that employs error correction coding on multiple data signals. That is, the specification only positively discloses (1) and (2) separately. In

contrast, the specification does not positively disclose the actual ***application*** of (1) ***to*** (2). In particular, the specification *generically* states, "error correction coding techniques may also be employed on both the higher data rate and lower data rates signals with different coding gains" (Applicant's specification, p. 8, l. 20-22), but does not *specifically* state which particular techniques to employ. Although one may glean from the specification that it *may be possible* to *specifically* apply (1) Reed-Solomon coding, G.709 coding, and G.975 coding to (2) the embodiment of Applicant's invention that employs error correction coding on multiple data signals, the fact remains that the specification does not actually specifically disclose this detailed application of (1) to (2). Accordingly, Applicant's arguments regarding this rejection of claims 2-4, 10-12, 18-19, and 28-30 under 35 U.S.C. 112, first paragraph, is not persuasive.

35 U.S.C. 103

12. Applicant's arguments, filed on 28 April 2006 (p. 14-16), with respect to the previous rejection of claims 1-7, 9-14, 16, 18-25, and 27-33 under 35 U.S.C. 103, have been fully considered but they are not persuasive.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning (filed on 28 April 2006, p. 15 last paragraph), it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In particular, notice the motivation in the standing rejection of the claims:

> "One of ordinary skill in the art would have been motivated to do this to implement further upgrading of channels (col. 6, l. 8)" (excerpted from the treatment of claim 1 above).
>
> "The motivation would be the common improvement of increased transmission capacity (col. 6, l. 8), which is an explicit purpose of Swanson's teachings (col. 3, l. 3-7)" (excerpted from the treatment of claim 1 above).

That is, the explicit purpose of Swanson's teachings is to provide a method and apparatus "for upgrading existing optical communication systems to provide increased transmission capacity" (col. 3, l. 3-6). Swanson provides an explicit example of upgrading one channel (Fig. 3). Additionally, Swanson

considers the future upgrading of multiple channels (col. 6, l. 8, 27-29, 53-54). Therefore, an obvious method of providing such future upgrading would be to apply the same basic principles of Swanson's one-channel example in Fig. 3 to other channels. Such application of Swanson's teachings would simply be repeated application of Swanson's basic principles, not improper hindsight reasoning. Accordingly, Applicant's argument of improper hindsight reasoning is not persuasive. Hence, Examiner respectfully maintains the standing rejections.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth N. Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DSK

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER

REPLACEMENT SHEET

Approved by DSK
05 July 2006

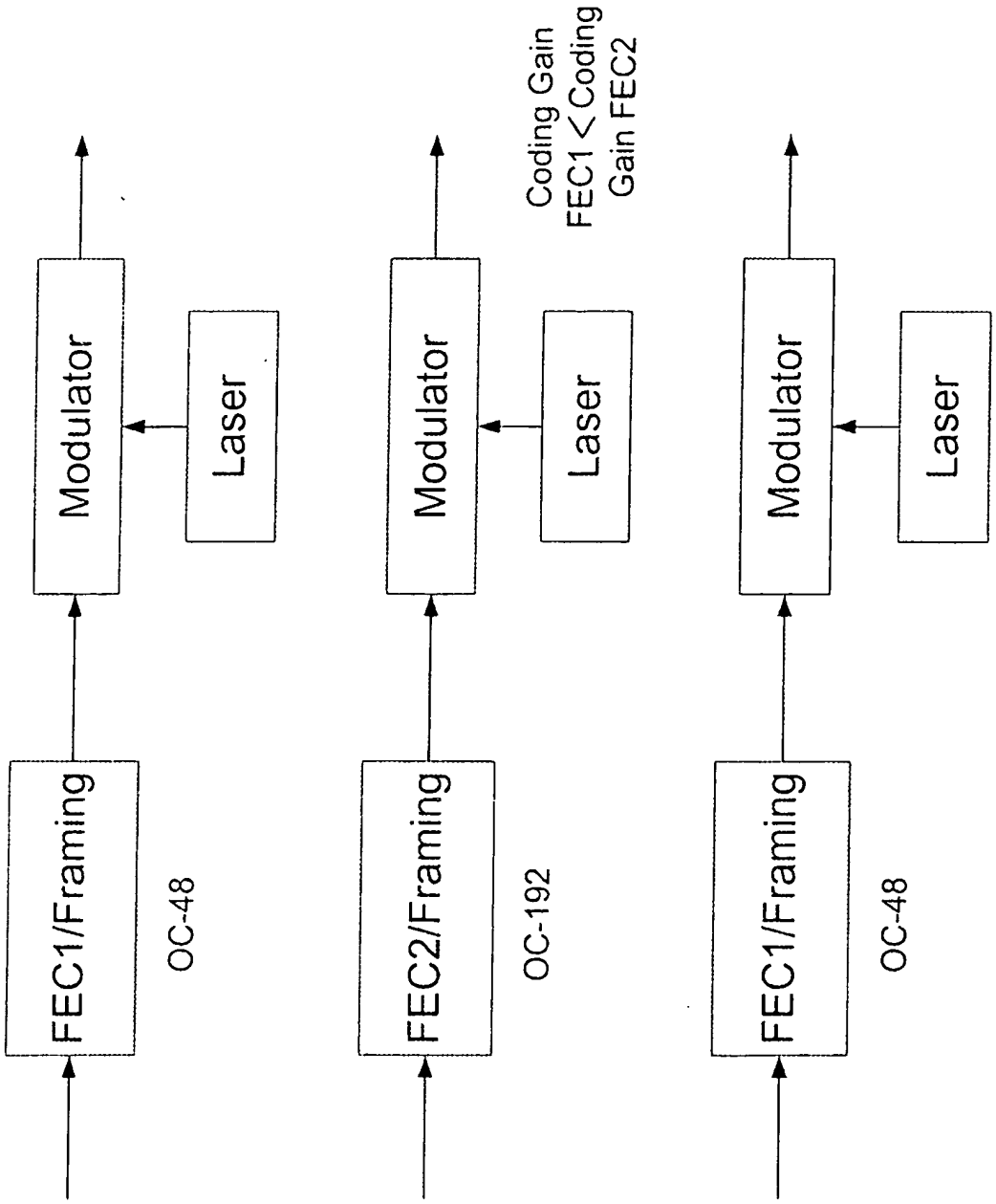

Fig. 4A